WOLF CREEK
NUCLEAR OPERATING CORPORATION

Clay C. Warren
Chief Operating Officer

December 23, 1997
WO 97-0141

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Subject: Docket No. 50-482: Licensee Event Report 97-024-00

Gentlemen:

The attached Licensee Event Report (LER) 97-024-00 is being submitted pursuant to 10 CFR 50.73(a)(2)(iv) concerning Engineered Safety Features and Reactor Protection System actuations. The actuations were caused by a spike on the Ex-Core Neutron Monitoring System Nuclear Instrument NI-35 Intermediate Range Channel.

If you should have any questions regarding this submittal, please contact me at (316) 364-8831 Extension 4485, or Mr. Michael J. Angus at extension 4077.

Very truly yours,

Clay C. Warren

Clay C. Warren

CCW/jad

Attachment

cc: W. D. Johnson (NRC), w/a
E. W. Merschoff (NRC), w/a
J. F. Ringwald (NRC), w/a
K. M. Thomas (NRC), w/a

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WARREN,C.C. Wolf Creek Nuclear Operating Corp.
RECIP.NAME RECIPIENT AFFILIATION
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SUBJECT: Forwards LER 97-024-00 re ESFs & RPS actuations which were caused by spike on ex-core neutron monitoring sys nuclear instrument NI-35 intermediate range channel.

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APPROVED BY OMB NO. 3150-0104
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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
WOLF CREEK GENERATING STATION	05000482	1 OF 4

TITLE (4)

Engineered Safety Features and Reactor Protection System Actuations Due to a Spike on the Ex-Core Neutron Monitoring System (SE) Nuclear Instrument NI-35 Intermediate Range (IR) Channel.

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV. NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	29	97	97	24	00	12	23	97	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	MODE 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	007 percent		20.402(b)		20.405(c)	X	50.73(a)(2)(iv)		73.71(b)
			20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER
			20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		VOLUNTARY
			20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
			20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Michael J. Angus Manager, Licensing and Corrective Action	316-364-8831 Extension-4077

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES	X	NO				

ABSTRACT (16):

On November 29, 1997, at 14:37 Central Standard Time a reactor trip occurred at the Wolf Creek Generating Station (WCGS). The plant was in mode one, at seven percent power, at the time of the trip. The Engineered Safety Features (ESF) and Reactor Protection System (RPS) performed as required. The automatic actuation of the reactor trip occurred as expected, with all rods inserting fully.

Subsequent investigation revealed that the reactor trip was caused by a spike on the Ex-Core Neutron Monitoring System (SE) Nuclear Instrument NI-35 Intermediate Range (IR) Channel. The spike exceeded the Intermediate Range High Flux trip setpoint of the current equivalent of twenty-five percent Rated Thermal Power (RTP). The cause of the spike is indeterminate. Based on the investigations performed, no anomalies have been identified that can be confirmed to have caused the IR High Flux trip. Corrective actions included stabilizing the plant, and investigating causes.

Plant Conditions Prior to the Event:

MODE = 1
Reactor Coolant Pressure: 2239 psig
Reactor Power: 7 %

Basis for Reportability:

This report is submitted to document an automatic actuation of the Reactor Protection System (RPS) [JC] and the Engineered Safety Features (ESF) [JE]. This incident is reportable under 10 CFR 50.73(a)(2)(iv) which requires the Licensee to report any event or condition that resulted in manual or automatic actuation of an Engineered Safety Feature (ESF), including the Reactor Protection System (RPS).

Description of Event:

On November 29, 1997, at 14:37 Central Standard Time a reactor trip occurred at the Wolf Creek Generating Station (WCGS). The plant was in Mode one, seven percent power, at the time of the trip. Prior to the trip, the plant was stable with no rod motion or other reactivity manipulations in progress. The Reactor Protection System (RPS) and the Engineered Safety Features (ESF) performed as required. The automatic actuation of the reactor trip occurred as expected, with all rods inserting fully.

The plant was stabilized using the appropriate procedures, and Emergency Action Levels (EALs) were reviewed for any actions required. Performance Improvement Request (PIR) 97-3937 was issued to track and document investigations and corrective actions. The NRC Resident Inspectors were notified at 15:14 CST, and the RPS actuation was reported to the NRC on the ENS, as required by 10 CFR 50.72(b)(2).

Work Package 126224 was written to investigate the cause of the reactor trip and troubleshoot Intermediate Range (IR) channel N-35. Subsequent investigation revealed that the reactor trip was caused by a spike on the SE Nuclear Instrument NI-35 Intermediate Range (IR) Channel. The spike exceeded the Intermediate Range High Flux Trip setpoint of the current equivalent of twenty-five percent Rated Thermal Power (RTP).

Four items were immediately checked as potential causes of the spike, and subsequent trip:

1. **Plant Transients**. The spike was rapid enough that the NR-45 nuclear recorder trace is small and doesn't extend to the level that is equivalent to the trip setpoint. None of the independent, or redundant indications of reactor power (Power Range NIs, Post Accident NIs, and Delta-T's), showed any indication of a power transient occurring at the time of the IR trip, and no evolutions were occurring at the time that would have caused this type of transient.

2. **Cycle 10 IR Trip Setpoints Calculation.** This calculation was reviewed and no errors were identified. The trip setpoints are similar in magnitude to the startup IR trip setpoints from Cycle 9.

3. **Cycle 10 IR Trip Setpoints Calibrations.** The calibration procedures used to implement the setpoints were reviewed. No anomalies were observed during the calibration, and correct values were used.

4. **Instrumentation problems.** The NI-35 spike was recorded on the SE NR-45 trend recorder, and captured as Nuclear Plant Information System (NPIS) archive data. Other than capturing the spike, the NPIS data does not yield much information because of the way the points are set to archive. Pre-trip trends on SE NR-45 and NPIS showed nothing abnormal with NI-35.

Details of the above investigation, as well as reviews of troubleshooting, instrumentation trending, power supply and amplifier status, the potential for ground faults and cable connector faults, compensation voltage and calibration checks, and potential detector aging, are documented in Performance Improvement Request (PIR) 97-3937. Based on the investigations performed, no anomalies have been identified that can be confirmed to have caused the IR High Flux trip.

Procedure AP 20-002, Revision 1, "Post Trip Review" was completed and approved November 30, 1997. Permission to restart the reactor was given at 16:50 CST on November 30, 1997. The plant entered Mode 1 at 23:02 CST on November 30, 1997.

Root Cause:

The root cause of this event was an intermittent positive spike on the Intermediate Range (IR) Channel NI-35. The amplitude of the spike exceeded the High Flux trip setpoint of current equivalent of twenty-five percent of RTP. The cause of the spike is indeterminate. Based on extensive investigation, no anomalies have been identified that can be confirmed to have caused this spike.

Corrective Actions:

- The plant was stabilized using the appropriate procedures, and Emergency Action Levels were reviewed for any actions required.
- Performance Improvement Request 97-3937 was issued to track and document investigations and corrective actions.
- Work Package 126224 was written to investigate the cause of the reactor trip and troubleshoot Intermediate Range channel NI-35.

- The NRC Resident Inspectors were notified at 15:14 CST, and the RPS actuation was reported to the NRC on the ENS, as required by 10 CFR 50.72(b)(2).

Safety Significance:

This event is not safety significant. The Intermediate Range detector functioned as designed to trip the reactor when the channel experienced a spike of greater than current equivalent of twenty-five percent Rated Thermal Power (RTP). The Intermediate Range High Flux Trip setpoint of current equivalent of twenty-five percent RTP is normally blocked when reactor power is above the P-10 permissive (2/4 Power Range channels greater than 10% power), and the plant was stable at approximately 7% power. The purpose of the Intermediate Range High Flux Trip is to protect against a rapid power increase. The power range selected to the SE NR-45 nuclear recorder registered no increase in power indicating there wasn't an actual increase in power occurring in the core, and the trip was solely due to IR SE NI-35 spiking.

This event did not jeopardize the health and safety of the public. The Reactor Protection System and the Engineered Safety Features performed as required. The automatic actuation of the reactor trip occurred as expected, with all rods inserting fully.

Other Previous Occurrences:

A similar incidence of reactor trip and Engineered Safety Features actuation due to a spike on a channel of the power range instrumentation occurred on July 31, 1985. This event was due to an electrical spike on the NI-42 channel of the power range nuclear instrumentation. The channel spiked low, and the spike was caused by a faulty power supply. No other previous occurrences of reactor trip due to channel spikes of the power range instrumentation have been identified at WCGS.